

# DIVERSITY AS A GENERAL BASIS OF TOURISM – SYSTEM APPROACH

## DIVERZITA JAKO ZÁKLAD TURIZMU – SYSTÉMOVÝ PŘÍSTUP

*Prof. Ing. Ctirad Schejbal, CSc., dr.h.c.*

*Hornicko-geologická fakulta, VŠB-TU Ostrava  
17. listopadu 15/2172, 708 33 Ostrava-Poruba, Czech republic  
e-mail: ctirad.schejbal@seznam.cz*

### Abstract

The general basis for tourism consists in the diversity of natural and man-made environment. The diversity can be considered as a natural characteristic of natural and anthropogenic systems produced by them as a condition of its continuance and development at all levels. When assessing tourism, geodiversity, biodiversity and socio-economic diversity, which includes technological diversity might be defined. Geodiversity and biodiversity coupled with technological diversity for the basis of geoscience and montanistic tourism. In the case of biodiversity, in terms of tourism regional and structural types of diversity are particularly important that can be parallelized with a geotope and a geophenomenon. The aim is to highlight the need for system approach to the analysis of tourism as a complex phenomenon with a complex structure.

### Abstrakt

Obecným základem turizmu je diverzita přírodního a antropogenního prostředí. diverzitu lze považovat za přirozenou vlastnost přírodních a antropogenních systémů, kterou si samy vytvářejí, jakožto podmínku svého setrvání a rozvoje na všech úrovních. Při posuzování turizmu lze vymezit geodiverzitu, biodiverzitu a socio-ekonomickou diverzitu, jejíž součástí je technologická diverzita. Geodiverzita a biodiverzita představuje spolu s technologickou diverzitou základ geovědního a montánního turizmu. V případě biodiverzity je z hlediska turizmu důležitá především regionální diverzita a strukturní diverzita, které lze paralelizovat s geotopem a geofenomémem. Cílem je poukázat na nutnost systémového přístupu k analýze turizmu jako komplexního jevu se složitou strukturou.

**Keywords:** diversity in tourism, dystem approach, geodiversity, biodiversity, socio-economic diversity, technological diversity, regional and structural diversity, geotop, geophenomenon, biotop, geoscientific and montanistic tourism

## 1 INTRODUCTION

If we look at the development and orientation of tourism, it is clear that people travel mainly to explore natural, historical, cultural and technological attractions. The public interest increasingly affects all objects that are in the concept of UNESCO components of natural, historical and cultural heritage of mankind.

An important trend can be seen in the growing interest in living and inanimate nature, but also technical monuments. Specialized agencies prepare and organize tours of geoscience and historic industrial objects. Increasing attention is paid to geological phenomena such as volcanoes, large and deep canyons, huge isolated monoliths, karst areas, large rock cities, interesting areas in terms of the evolution of rocks, meteor craters, and sinter formations. For keen collectors of minerals and fossils, the visit of their accessible sites, points of sale or mineralogical museums will surely be attractive. Geoparks and nature educational trails arise, informing visitors on the geological structure of the territory. More and more attention is paid to technical and cultural monuments associated with the use of natural resources, particularly mining, which demonstrate their formation such as mining museums, open-air museums and educational trails, and a growing interest in direct visits to mines and large surface mines can be seen as well. A number of mining sites are included among the protected objects; several of them have even been inscribed on the UNESCO's list of World Heritage.

These trends are also reflected in modern definitions of tourism, and they are legion. An extensive, process- and phenomenon-oriented definition is given in an explanatory dictionary (Pásková, Zelenka, 2002): "Tourism is a complex and in many areas and for many aspects of interpenetrating social phenomenon without any fixed determinable boundaries, which is a synergistic sum of all phenomena, relationships and impacts in a spatio-temporal context associated with the increasing mobility of people motivated by satisfying their needs for leisure, recreation, travel, knowledge, social, cultural and other areas."

Such a concept of tourism is in full in accordance with the orientation of the UNWTO, as a result of conceptual materials received from both international and national organizations.

Considering the above facts, it is obvious that the general basis for tourism consists in the *diversity of the natural and anthropogenic environment*.

## 2 DEFINITION OF DIVERSITY

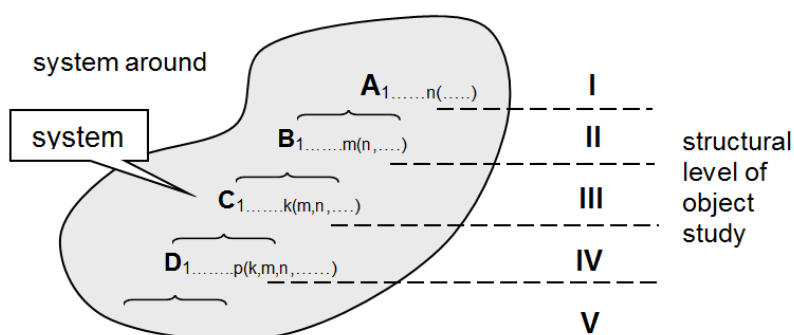
When analyzing the diversity, we have to come out of general systems theory, which represents a transdisciplinary study of abstract organization of phenomena, independent of their nature, type, spatial and temporal scales of existence. It examines the principles common to all complex objects and models that can be used to describe them.

Ludwig von Bertalanfy defined, in the 1951, a system as a set of elements that are correlated with each other. Interactions between the parts are very important characteristics of the whole unit which may exhibit properties that do not result directly from the characteristics of its parts. The core of both systems approach and systems theory lies in several interrelated principles characterizing not only the way of thinking and comprehension of reality, but also the processes occurring in the actual reality. These principles include structured nature, hierarchy, integrity, feedback and mutual relations of the system and environment.

From the perspective of the study of natural and anthropogenic systems, their hierarchical structuralization is important, in which each element belonging to a certain level stands higher than the element belonging to another hierarchically lower level.

Each system unites its relatively independent components that are arranged in a certain spatial structure. The rate of description and analysis of an examined object, either natural or anthropogenic, described by this system depends on the details of study (Fig. 1). The general problem is that in every object there is a "barrier of randomness", which does not, even with an improved observation system, go beyond its recognizability.

In the general concept, the basic property of systems lies in diversity expressing the heterogeneity of their elements. Generally, it can be regarded as a natural attribute of natural and anthropogenic systems, generating themselves as a condition of their continuance and development at all levels, but at different speeds, which complicates the possibility to perceive the development of diversity and influence. Diversity is also seen as a measure of system stability, because, in a crisis, a uniform system usually collapses as a whole, unlike a diverse system where only its individual parts are affected by the crisis, but the whole remains functional. It is clear the universal concept study of natural and anthropogenic systems deals with diversity elements that constitute the system (Sirageldin, 2002).



A, B, ... - structural levels; 1 ... x – elements of structural level

**Fig. 1 Model of object study (Schejbal, 2000)**

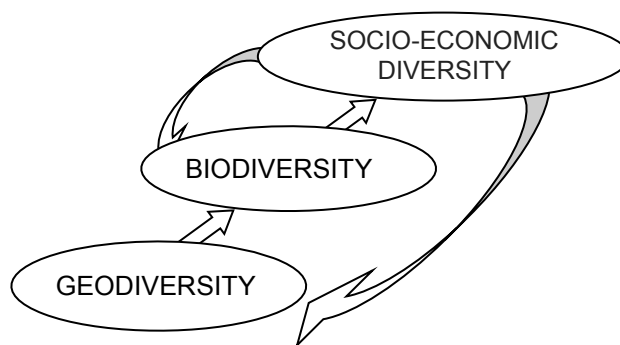
A different approach to practically analogous issue in the natural-anthropogenic sphere is represented by the holarchy as the particular type of a network structure, in which the basic units called holon (a combination of the Greek word holos - whole and suffixes on - part) can be arranged both in hierarchical and heterarchical manners or a combination thereof. The word holon Koestler (1969) used for the description of a basic unit in biological and social systems. Each holon is of a dual nature, since it acts in the structure either as a whole or as part of a holon higher level. At certain level, it can be a triad by both material structure and relational functions

{examined level - behaviour at a higher level - behaviour at a lower level}.

Generally speaking, it is the principle of mutually nested hierarchical structure.

Diversity can be seen as a natural property of nature and human society they created themselves as a condition of their existence. The higher the level of a diverse system, the more stable the system is. Development processes take place at all levels of natural and anthropogenic systems, but at different speeds, which complicates our ability to perceive the creation of diversity and influence for the benefit of the system.

Generally, when considering tourism, we can define geodiversity, biodiversity and socio-economic diversity, which can be further divided to cultural diversity, economic diversity and socio-diversity. It can be said that the term geodiversity is a complementary expression to the concept of biodiversity.



**Fig. 2 Mutual relations of diversities**

## 2.1 Geodiversity

Geodiversity includes a wide range of terrestrial features - geological, geomorphological, palaeontological, soil, hydrological and atmospheric elements, systems and processes as presented in the Australian Natural Heritage Charter (Cairnes, 1997). This set of abiotic factors and processes represents a guiding principle for development opportunities of wild life (Ložek 2005). Čílek (2002) briefly defines geodiversity as a substrate (rock) and morphological diversity of a given area. According to Gray (2004), geodiversity can be defined as "the natural community geological, geomorphological and soil features. Those include their sets, relationships, properties, interpretations and systems." Processes of formation are the result of very complicated pathways of development of the Earth from the early to contemporary forms. There is no doubt that each of the lithospheric plate and each of its sub-components is developed independently and strongly differentiated. Therefore, there is a wide spectrum of geotopes, i.e. geologically distinguishable parts of the landscape, e.g. outcrop, a group of outcrops, geomorphological formation, the structural-tectonic and rock terrain, etc. (Dowling 2013). That provides insights into the evolution of the Earth (Sturm and Hipp 1999, Frost and Steingötter 2001). Thus - according to Eberhard (1997) - geodiversity summarizes the evidence of history of the Earth and defines processes that affect the environment. Geodiversity represents the general basis of such types of tourism that are turning to nature, whether they are referred to by various names (Schejbal 2005). In this context, Sharples (1993) emphasized the importance of geoconservation of geodiversity storage for future generations. A crucial role in this respect is played by geotourism as it states geoconservation into practice and promotes its understanding of broad public policy (Eder - Patzak, 2004). Several authors dedicate climate and microclimate diversity, but they can be understood as part of geodiversity.

Geodiversity of the landscape in the Czech Republic is high and therefore unique. Tichá (2007/2008) even argues that geological and geomorphological diversity of Central Europe is similar to the diversity of wildlife in the tropical rainforest. Summary records of important geological sites were created by the Czech Geological Survey. In 2014, 2,833 of sites were included in the database and 295 were prepared for inclusion. Hundreds of geotopes are found in each European and national geopark.

## 2.2 Biodiversity

Biodiversity is defined as the complete set of genes, species and ecosystems in a certain landscape area or the marine environment. In the Guide to the Convention on Biological Diversity, which was adopted in 1992 in Rio de Janeiro (Glowka et al. 1994), biodiversity is defined as the variety of life in all its forms, levels and combinations. This is not the mere sum of genes, species and ecosystems, but rather the variability within and between them. Briefly and simply speaking, it is the number of species from the simplest ones to the humans that occur in a given territory.

The environment that fulfills demands of life characteristic for the species of plants and animals is called a biotope. It is affected by the soil background, climate and influence of surrounding organisms. 161 of natural habitats which are divided into eight formational groups, and 14 types of non-natural habitats, were specified in the Czech Republic (Chytrý et al, 2001).

The recognition that biodiversity is directly linked to geodiversity is important. This means that the character and the variability of components of the biosphere depend on the construction and composition of the geosphere. Therefore, the concept of geobiodiversity has appeared recently. The development of the tourist industry should be planned and managed so as to avoid negative impacts on the biosphere and its diversity. There is evidence that reasonably led development has a positive impact on biodiversity conservation.

In connection with the assessment of biodiversity, it is necessary to state the term "phenomenon" defined by Ložek (2005) as follows: "The phenomenon in the ecology (ecophenomenon) is a pronounced set of processes and habitats with characteristic communities of plants and animals suspending geological substrate and topography in a certain defined district that due to its impact, especially high diversity, noticeably departs from the surrounding landscape."

While in ecological and conservation circles, biodiversity ranks among the leading topics of discussions, geodiversity still remains out of sight. From the perspective of nature conservation, it was attached only subordinate importance simply because the living nature seemed in comparison with inanimate nature as always more vulnerable. But it is an indisputable fact that even the inanimate state of nature undergoes a long-term development with a number of impacts on wildlife. In our countries, they were mainly caused by changes in the quaternary climate-sedimentation cycle whose main manifestation was the alternation of cold and warm periods - glacial and interglacial (Ložek, 2005). In the short term, the changes can be observed that are caused by agricultural, water management and industrial activities and the construction of housing estates and linear constructions.

### 2.3 Socio-economic diversity

The concept of socio-economic diversity combines both general group and personality characteristics. This concept includes a wide range of very diverse characteristics of individuals such as dimensions of race, ethnicity, gender, sexual orientation, socio-economic status, age, physical ability, religion, political beliefs, or other ideologies.

On a similar principle as in the case of natural diversities, cultural diversity can be defined as a spontaneously emerging variety of human cultures or activities in a certain region or in the world, which is the basis of their stability. It includes cultural differences between people, such as language, dress codes, traditions, institutions, concepts of morality and religion, and relationship to the environment. The Convention on the Protection and Promotion of Cultural Diversity of Cultural Expressions was adopted at the General Conference of UNESCO on October 20, 2005. It builds on the Universal Declaration on Cultural Diversity, adopted in 2001, which indicates cultural variety as a source of exchange, innovation and creativity as a general reference of humanity. The Istanbul Declaration of 2002 states that the cornerstones of the cultural identity of nations and communities include expressions of intangible cultural heritage such as language variety and a set of practices, knowledge, ethical principles, etc. By analogy with biodiversity, which is regarded to be essential for long-term survival of life on the Earth, it can be argued that cultural diversity may be crucial for long-term survival of humanity, and the preservation of local national and indigenous cultures can be just as important for mankind as conservation of species and ecosystems for life in general.

Under the concept of economic diversity a variety of diversity economies of all economic entities can be included. There are various concepts of diversity, from the level of individuals, families, up to the largest community of people (nations, states, etc.), from a microeconomics to macroeconomics. In the Glossary of tourism, we find the following definition: "Economic diversity is the variety of economic sectors in the territory of a country or region. ...ensures long-term economic stability and resistance against random fluctuations" (Pásková a Zelenka, 2002). Observe that it is the concept that worked from the very beginning of human history to the present, thus the stage of globalization.

Sociodiversity expresses the variety of life forms of man as a creature determined by social and cultural-historical conditions who lives in a certain natural and social environment which affects his way of life. On the other hand, it is obvious that human beings also transform their environment by their social activities. Sociodiversity covers all aspects of the diversity of phenotypes and roles of individuals within the studied communities. Pásková and Zelenka (2002) define sociodiversity as "a degree of diversity in society which is based on the amount of distinctive social groups that share the summary of values and traditions, behaviours, lifestyles, customs and other unwritten rules specific to a certain community, economically, socially, religiously or ethnically different communities of people. As Tichá pointed (2007/2008), such concept in many respects coincides with cultural diversity.

In terms of montanistic tourism, a decisive component in addition to geodiversity is disparity of technologies that were and are used in mining and processing mineral resources. This technological diversity varies historically and regionally. Corresponding monuments and relics form the basis of tourism products oriented to this sphere.

## 3 TIME CHANGES IN DIVERSITY

During the development of natural and anthropogenic systems, more or less significant changes happened in their diversity. These changes are in human terms easily observed in the biological and socio-economic areas and, therefore, they are paid great attention as evidenced by a number of research reports and publications. Changes of geodiversity, if not caused by human activity, outside the geoscience community are not heard much,

if at all. The changes occur gradually over decades rather than centuries to millennia. The exceptions may be catastrophic phenomena – earthquakes, volcanic eruptions, floods, tsunamis or large block landslides and rock falls.

Historically speaking, geodiversity, like biodiversity, is affected by changes. This can lead to a gradual impoverishment, but also to enrichment of landscape forms.

Processes caused by man – landscaping, construction of transport infrastructure, [raw material mining](#), etc. are sometimes not included under the term geodiversity. When we realize, however, that every year the transfer of huge amounts of materials take place in both natural and artificial way, it is clear that the processes associated with these changes are reflected in the formation of georelief and the creation of both negative and positive micro-relief elements.

Human started to affect the landscape since the beginnings of pastoralism and agriculture, in our country before about seven millennia. Deforestation and planarization together with linearization gradually changed the landscape to the present situation, which eliminated the wide range of diversity and interesting for tourism geocofenomens. According to Čilek (2002) “use of the landscape in the 20th century glimmers primitive neofunctionalism which loves rectangular river flows, aligned huge field, flat roofs and simple, but often inhuman geometric elements.” The negative impacts of this approach are well known. To illustrate this, in the Czech Republic, around 2 million tons by water flows and by human activity 550 million tons of raw materials are annually displaced. A number of studies have shown that the abandoned mines, slag heaps or tailings ponds can belong to places with the most valuable nature, respectively, with unusual plant and animal communities that deserve protection and subsequent use in specialized tourism. Therefore, it is sometimes the best strategy to let nature free hand.

Not only from the perspective of geoscientific and montanistic tourism, but especially from the perspective of further development of human society, it is necessary to protect and where possible develop natural and anthropogenic diversity. Čilek (2002) distinguishes between primary, i.e. natural geodiversity, and secondary diversity (anthropogenic). In his opinion, it is necessary to protect primary geodiversity, but not preserve. In secondary geodiversity, there is a difficult problem. Practical solutions encounter various obstacles that arise mainly from the complexity of the problems. Therefore, rather selective protection of certain components of diversity (e.g. certain plant and animal species) is often implemented while the protection of units (ecosystems, geotopes or geocofenomenons) is neglected.

Tourist activities can affect the landscape in both positive and negative sense. Positive effects include the professionally oriented efforts to conserve and return geocotops to their natural state. The negative impact includes influencing ecosystems (distortions of vegetation and land cover, disturbance of the recording composition of plant communities, erosion by trampling and various shortcut routes, poorly localized infrastructure construction, etc.).

#### 4 DIVERSITY IN THE GEOSCIENTIFIC AND MONTANISTIC TOURISM

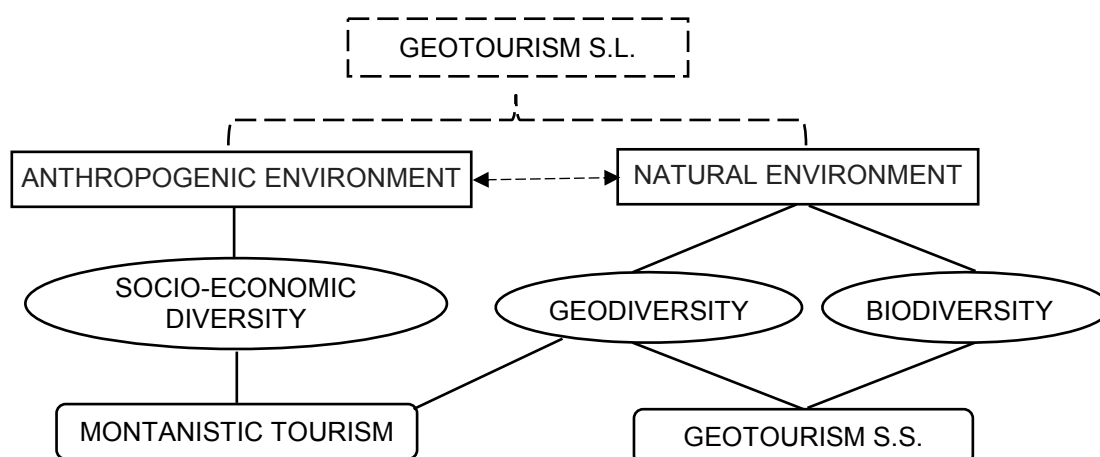
Geodiversity and biodiversity form the basis of geoscientific and montanistic tourism. In the case of biodiversity, in terms of tourism, particularly regional (gamma) diversity and structural (beta) diversity are important, which can be parallelized with geotope and geophenomenon.

To summarize the approaches that have emerged in relation to geotourism, it is clear that there are two concepts:

- a) geotourism sensu stricto (s.s.) as a form of tourism focused on learning about geological phenomena, collecting fossils, etc.;
- b) geotourism sensu lato (s.l.) including all forms of tourism realized on earth, i.e. in geographical sense (Holeček and Fridgen, 2002).

In the Geotourism Charter, geotourism is defined as „tourism that sustains or enhances the geographical character of a place – its environment, culture, aesthetics, heritage, and the well-being of its residents“, thus, in the broad sense.





**Fig. 3 Position of montanistic and geoscience tourism in diversity system**

From our perspective, the focus is on the concept of geotourism s.s., thus the geoscientific concept. Geoscience tourism (geotourism s.s.) relies on a broad spectrum of geotopes and geophenomena which are the subject of research. Very effective source for the creation of tourism products may be geoparks (Český ráj as part of the European network of geoparks as well as Železné hory National Geopark, GeoLocí Geopark, Vysočina Geopark, etc.). On the creating of a network of national geoparks, the Czech Ministry of Environment decided in 2007. Locally, the geological nature trails are significant attractions.

Montanistic tourism is primarily based on diversity of mineral raw materials, which reflects the evolution of the Earth. We cannot ignore the evolution and diversity of mining, dressing and metallurgical technologies. In the Czech Republic, there are a number of evidences in the form of more or less preserved monuments and attractions that are stored in a number of mining museums (Příbram, Ostrava, Kutná Hora, etc.), open-air museums and nature trails. Several of the historical mining facilities are made accessible to public, for example the tin mine Jeroným in Čistá, mine workings in Příbram and in Kutná Hora, etc. The world's important part of the history of mining in the Czech countries rests on the first mining laws (law *Iura montium et montanorum* of King Wenceslas I from 1249 in Jihlava and law *Ius regale montanorum* of King Wenceslas II from 1300 in Kutná Hora). In addition, it is necessary to emphasize not only the importance of montanistic teachings for developing the use of mineral resources, but generally for the growth of technical knowledge.

## 5 CONCLUSION

Natural and anthropogenic potential conditioning the development of tourism has significant territorial aspect and is bound to the demarcated landscape systems. It expresses the ability of the territorial unit to create conditions for the development of tourism. It is distributed unequally and qualitatively in different manners, and usually varies within large territorial units. It is certainly remarkable that geodiversity is linked not only to biodiversity, but usually also to socio-economic diversity.

In the introduction to the report *Status and Trends of Biodiversity, Czech Republic Overview (2005)*, there is indicated as follows: „In spite of its relatively small size (78,866 square km), the Czech Republic (CR) is characterized by a high wild plant and animal species richness and diversity. This results from its geographical position at the boundaries between several biogeographical regions, morphological and geological diversity and also from historical and cultural developments.“

This study aims at highlighting the need for in-depth system approach to the analysis of tourism complex structures. Geoscience and montanistic tourism in itself connects geodiversity and biodiversity with links to socioeconomic diversity, especially to technological diversity. It represents a specialized form of tourism within the meaning of the material concept (Schejbal 2011), which reflects the general trends in the tourism industry.

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## RESUMÉ

Významnou tendencí ve sféře turizmu je *růst zájmu o živou a neživou přírodu, ale i o technické památky*. Je zjevné, že obecným základem turizmu je diverzita přírodního a antropogenního prostředí. Diverzitu lze považovat za přirozenou vlastnost přírody i lidské společnosti, které si samy vytvářejí jakožto podmínku svého setrvání. Obecně lze při posuzování turizmu vymezit geodiverzitu, biodiverzitu a socio-ekonomickou diverzitu, kterou můžeme dále dělit na kulturní diverzitu, ekonomickou diverzitu a sociodiverzitu. Je jistě pozoruhodné, že geodiverzita je propojena nejen s biodiverzitou, ale zpravidla i s diverzitou socio-ekonomickou.

*Geodiverzita* zahrnuje celou šíři zemských rysů - geologických, geomorfologických, paleontologických, půdních, hydrologických i atmosférických prvků, systémů a procesů (Australian Natural Heritage Charter, 1997). Existuje široké spektrum geotopů, tj. geologicky odlišitelných částí krajiny (např. výchoz, skupina výchozů, geomorfologický útvar, strukturně-tektonický či horninový terén apod.), které poskytují poznatky o vývoji Země.

*Biodiverzita* je definována jako úplný soubor genů, druhů a ekosystémů v určité krajinné oblasti či mořském prostředí. Prostor, který splňuje charakteristické nároky pro život pro dané druhy rostlin a živočichů, se nazývá biotop. Je ovlivněn podmínkami půdního podkladu, podnebí a vlivem okolních organismů.

V důsledku bezprostředního sepětí biodiverzity s geodiverzitou se v poslední době objevuje i pojem *geobiodiverzita*. V souvislosti s hodnocením geobiodiverzity je třeba uvést ještě termín *fenomén*, který definuje Ložek (2005).

*Socio-ekonomická diverzita* v sobě spojuje jak obecné skupinové, tak osobnostní charakteristiky. Lze ji dále dělit na kulturní diverzitu, ekonomickou diverzitu a sociodiverzitu. Na obdobném principu, jako v případě přírodních diverzit, lze ji definovat jako samovolně vznikající rozmanitost lidských aktivit nebo kultur v jistém regionu, či v celém světě.

V průběhu rozvoje přírodních a antropogenních systémů dochází k více či méně významným změnám jejich diverzity. Tyto změny jsou z lidského hlediska dobře pozorovatelné v biologické a socio-ekonomické oblasti. Přirozené, tj. primární změny geodiverzity probíhají s výjimkou katastrofických jevů (zemětřesení, sopečné erupce, potopy, tsunami či rozsáhlé blokové sesuvy a řícení) pozvolně po desetiletí, ale obvykle po tisíciletí. Sekundární změny vyvolané působením lidí probíhají od počátků pastevectví a zemědělství do současnosti, kdy jsou v souhrnu značně významné.

Geodiverzita a biodiverzita představují základ geovědního a montánního turizmu. V případě biodiverzity je z hlediska turizmu důležitá především regionální (gama) diverzita a strukturní (beta) diverzita, které lze paralelizovat s geotopem a geofenoménem. Shrňme-li přístupy, které se objevily ve vztahu ke geoturizmu, je zřejmé, že existuje dvojí pojetí:

- a) geoturizmus s.s. jako forma turizmu zaměřená na poznávání geologických jevů;
- b) geoturizmus s.l. zahrnující všechny formy turizmu realizované na Zemi, tj. ve smyslu geografickém (Holecek a Fridgen, 2002).

Geovědní turizmus (geoturizmus s.s.) se opírá o široké spektrum geotopů a geofenoménů, které jsou předmětem výzkumu. Montánní turizmus je v první řadě založen na diverzitě nerostných surovinových zdrojů, která je odrazem vývoje zemského tělesa. Nelze opominout ani vývoj a diverzitu hornických, úpravárenských a metalurgických technologií.

Geovědní a montánní turizmus v sobě propojuje geodiverzitu a biodiverzitu s vazbou na socioekonomickou diverzitu. Představuje tak specializovanou formu turizmu ve smyslu materiálového pojetí, která odráží obecné vývojové tendence v odvětví turistického průmyslu.

Cílem této studie je upozornit na nutnost důkladného systémového přístupu k analýze komplexní struktury turizmu. Geovědní a montánní turizmus v sobě spojuje geodiverzitu a biodiverzitu ve vztahu k sociodiverzitě, zejména k technologické diverzitě. Jedná se o speciální formu turizmu ve smyslu materiálového pojetí, která odráží obecné trendy v odvětví cestovního ruchu.